

## More Energy:

- Law of Conservation of Energy:
  - Energy can be neither created nor destroyed.
  - Energy is transferred between categories.
  - Net Energy  $\rightarrow$  total amount of energy in a system
  - Total amount of energy must remain the same before and after transformations.

- Energy Conversion Examples:

- Lightbulb:

start with: Electrical  
End with: Light/Radiant  
Waste: Thermal

- Fan

Start: Electrical  
End: Mechanical  
Waste: Thermal/Sound





- Battery

Start: Chemical  
End: Electrical  
Waste: Thermal

- Fire

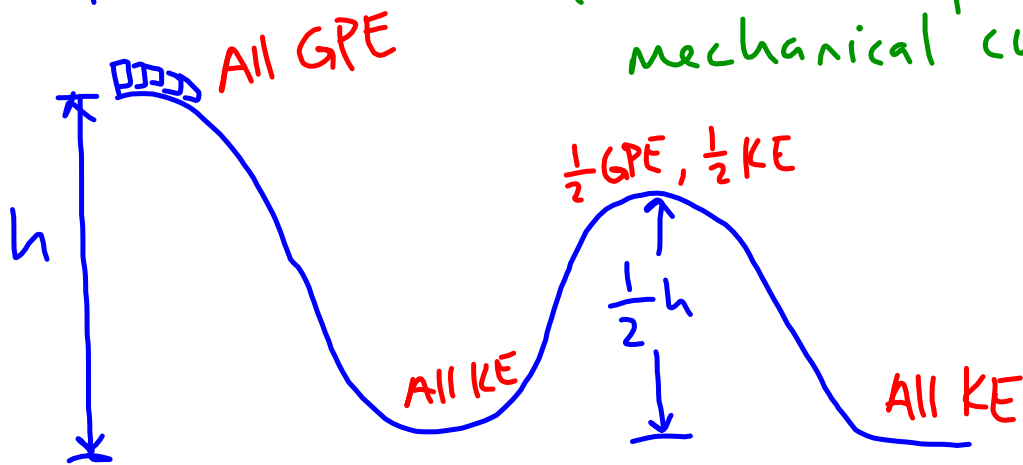
Starts: Chemical  
Ends: Thermal, Light/Radiant  
Waste: Sound, Chemical

- Mechanical Energy Conversion:
  - Conversion between kinetic and gravitational potential (GPE)

highest point (start from rest)		NO KE $\frac{1}{2}mv^2$	ALL GPE $mgh$
$\frac{3}{4}$		$\frac{1}{4} KE$	$\frac{3}{4} GPE$
$\frac{1}{2}$		$\frac{1}{2} KE$	$\frac{1}{2} GPE$
$\frac{1}{4}$		$\frac{3}{4} KE$	$\frac{1}{4} GPE$

$h=0m$   ALL KE NO GPE  
 just as box hits the ground

- Roller Coaster: (Assumed a perfect mechanical conversion)



- In real life, lose energy to sound and thermal.

• Swing:

